

### IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) An article comprising:  
a wire-bonding substrate including a first surface and a second surface, wherein the substrate includes at least one of:  
a bond finger disposed on the first surface, wherein the bond finger includes a metallization in the substrate, and includes a metallic surface finish above and on the metallization;  
a land pad for a ball attach on the second surface, wherein the land pad includes a metallization in the substrate, and includes a metallic surface finish below and on the metallization; and  
wherein the metallic surface finish has a higher electrochemical potential than the metallization in the substrate.
2. (Original) The article according to claim 1, wherein the metallization is a copper metallization, and wherein the metallic surface finish is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.
3. (Original) The article according to claim 1, wherein the metallic surface finish includes a first plating layer above and on the metallization, and a second plating layer above and on the first plating layer.
4. (Original) The article according to claim 1, wherein the metallization is copper, and wherein the metallic surface finish includes a gold first plating layer above and on the metallization, and a gold second plating layer above and on the gold first plating layer.
5. (Original) The article according to claim 1, wherein the metallization is copper, and wherein the metallic surface finish includes a first plating layer above and on the metallization

and a second plating layer above and on the first plating layer, and wherein the metallic surface finish is in a thickness range from about 0.01  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

6. (Currently Amended) An article comprising:

a wire-bonding substrate including a first surface and a second surface, wherein the substrate includes at least one of:

a bond finger disposed on the first surface, wherein the bond finger includes a metallization in the substrate, and includes a metallic surface finish above and on the metallization;

a land pad for a ball attach on the second surface, wherein the land pad exposes a metallization in the substrate, and includes a metallic surface finish below and on the metallization; and

wherein the metallic surface finish has a higher electrochemical potential than the metallization in the substrate ~~The article according to claim 1,~~ wherein the metallization is copper, and wherein the metallic surface finish includes:

a first plating layer above and on the metallization, wherein the first plating layer is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof; and

a second plating layer above and on the first plating layer, wherein the second plating layer includes an equal or higher electrochemical potential than the first plating layer, and wherein the metallic surface finish is in a thickness range from about 0.01  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

7. (Currently Amended) An article comprising:

a wire-bonding substrate including a first surface and a second surface, wherein the substrate includes at least one of:

a bond finger disposed on the first surface, wherein the bond finger includes a metallization in the substrate, and includes a metallic surface finish above and on the metallization;

a land pad for a ball attach on the second surface, wherein the land pad exposes a metallization in the substrate, and includes a metallic surface finish below and on the metallization; and

wherein the metallic surface finish has a higher electrochemical potential than the metallization in the substrate ~~The article according to claim 1,~~ wherein the metallization is copper, and wherein the metallic surface finish includes:

a gold first plating layer above and on the metallization; and

a gold second plating layer above and on the first plating layer, and

wherein the metallic surface finish is in a thickness range from about 0.01  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

8. (Currently Amended) An article comprising:

a wire-bonding substrate including a first surface and a second surface, wherein the substrate includes at least one of:

a bond finger disposed on the first surface, wherein the bond finger includes a metallization in the substrate, and includes a metallic surface finish above and on the metallization;

a land pad for a ball attach on the second surface, wherein the land pad exposes a metallization in the substrate, and includes a metallic surface finish below and on the metallization; and

wherein the metallic surface finish has a higher electrochemical potential than the metallization in the substrate ~~The article according to claim 1,~~ wherein the metallization is copper, and wherein the metallic surface finish includes:

a first plating layer above and on the metallization, wherein the first plating layer is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof; and

a second plating layer above and on the first plating layer, and wherein the second plating layer includes an equal or higher electrochemical potential than the first plating layer, ~~and wherein the second plating layer is more ductile than the first plating layer.~~

Claims 9-27. (Canceled).

28. (Currently Amended) An article comprising:

a wire-bonding substrate including a first surface and a second surface, wherein the substrate includes at least one of:

a bond finger disposed on the first surface, wherein the bond finger includes a metallization in the substrate, and includes a metallic surface finish above and on the metallization; and

wherein the metallic surface finish has a higher electrochemical potential than the metallization in the substrate, and wherein the metallic surface finish is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

29. (Previously Presented) The article of claim 28, wherein the metallization is a copper metallization, and wherein the metallic surface finish on the bond finger is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

30. (Previously Presented) The article of claim 28, wherein the metallic surface finish includes a first plating layer above and on the metallization, and a second plating layer above and on the first plating layer.

31. (Previously Presented) The article of claim 30, wherein the metallization is a copper metallization, and wherein the metallic surface finish is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

32. (Previously Presented) The article of claim 28, wherein the metallic surface finish includes a first plating layer above and on the metallization, and a second plating layer above and on the first plating layer, and wherein the metallic surface finish finger is in a thickness range from about 0.01  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

33. (Previously Presented) The article of claim 32, wherein the metallization is a copper metallization, and wherein the metallic surface finish is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

34. (Previously Presented) The article of claim 28, wherein the metallic surface finish includes a first plating layer above and on the metallization in a thickness range from about 10 Å to about 10,000 Å, and a second plating layer above and on the first plating layer, and wherein the metallic surface finish is in a thickness range from about 0.01 μm to about 10 μm.

35. (Previously Presented) The article of claim 34, wherein the metallization is a copper metallization, and wherein the metallic surface finish is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

36. (Previously Presented) The article of claim 28, further including a land pad for a ball attach on the second surface, wherein the land pad includes a metallization in the substrate, and a metallic surface finish below and on the metallization.

37. (Previously Presented) The article of claim 36, wherein the metallization is a copper metallization, and wherein the metallic surface finish on the land pad is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

38. (Currently Amended) The article of claim 36, wherein the metallic surface finish on the land pad includes a first plating layer below ~~above~~ and on the metallization land pad, and a second plating layer below and on the first plating layer.

39. (Previously Presented) The article of claim 38, wherein the metallization is a copper metallization, and wherein the metallic surface finish on the land pad is selected from gold, gold

alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

40. (Currently Amended) The article of claim 36, wherein the metallic surface finish on the land pad includes a first plating layer below ~~above~~ and on the metallization, and a second plating layer below ~~above~~ and on the first plating layer, and wherein the metallic surface finish on the metallization bond finger is in a thickness range from about 0.01  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

41. (Previously Presented) The article of claim 40, wherein the metallization is a copper metallization, and wherein the metallic surface finish on the land pad is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

42. (Currently Amended) The article of claim 36, wherein the metallic surface finish on the land pad includes a first plating layer below ~~above~~ and on the metallization in a thickness range from about 10 Å to about 10,000 Å, and a second plating layer below ~~above~~ and on the first plating layer, and wherein the metallic surface finish on the bond finger is in a thickness range from about 0.01  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

43. (Previously Presented) The article of claim 42, wherein the metallization is a copper metallization, and wherein the metallic surface finish on the land pad is selected from gold, gold alloy, silver, silver alloy, platinum, platinum alloy, iridium, iridium alloy, and combinations thereof.

### REMARKS

Claims 1, 6-8, 28, 38, 40 and 42 are amended; as a result, claims 1-8 and 28-43 are now pending in this application.

The claims have been amended to more particularly point out what Applicant regards as claimable embodiments. In particular, the Examiner and Applicant's counsel agreed that a bond

finger as disclosed and described includes exposed portions of a metallization, and the surface finish embodiments. A number of claims were amended to correct language such as “above” to “below”. No new matter was added by these amendments.

### §102 Rejection of the Claims

Claims 1-3, 28-31 and 36-39 were rejected under 35 USC § 102(b) as being anticipated by Joy et al. (U.S. 6,359,233). Applicant respectfully traverses this rejection and requests the Office to consider the following.

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” (*Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987), M.P.E.P. §2131, 8<sup>th</sup> Ed., Rev. 1).

Claim 1 requires “... a bond finger disposed on the first surface, wherein the bond finger includes a metallization in the substrate ....etc.” (Claim 1). Joy invariably teaches his metallization (bus bar 19) is above and on the surface of his substrate (web 11), which is not “in the substrate” as described and claimed in claim 1.

Joy also invariably teaches his bond finger (e.g., gold layer 29 and nickel layer 27) is above the surface of his substrate (web 11), which is not “in the substrate” as described and claimed in claim 1.

For either these two structural mismatches between what is claimed and what Joy teaches, Joy does not anticipate the claims. Withdrawal of the rejections is respectfully requested.

Claim 28 also includes the limitation of a metallization in the substrate, along with the other limitations, which is not anticipated by Joy. Withdrawal of the rejections is respectfully requested.

### §103 Rejection of the Claims

Claims 1-8 and 28-43 were rejected under 35 USC § 103(a) as being unpatentable over Joy et al. in view of Jackson (U.S. 5,097,100). Applicant respectfully traverses the rejection and requests the Office to consider the following.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (M.P.E.P. § 2143 8<sup>th</sup> Ed, Rev.1).

The Office Action admits that “Joy ... does not teach the conductive pad being two gold layers, nor does [Joy] teach the thickness of the conductive pad.” (Office Action at page 3). The Office Action appeals to Jackson to remedy that which it characterizes as what Joy does not teach.

Regarding the first criterion, Jackson's disclosure is contemplated for a structure “subject to corrosion in the environment where they are used ... for vehicle, vessel, and aerospace inertial navigation devices downhole oil well measurement and other uses.” (Jackson at column 1, lines 8 *et seq*). Joy is silent about harsh corrosive environments. The suggestion to combine these references appears to come from Applicant's disclosure and not from the references themselves.

Regarding the third criterion, Jackson also fails to teach that Joy does not teach; the elements of instant claim 1, “... a bond finger disposed on the first surface, wherein the bond finger includes a metallization in the substrate ....” (Claim 1). Because all the claims limitations have not been taught in the combination of the cited references, withdrawal of the rejection is respectfully requested.



AMENDMENT UNDER 37 C.F.R. 1.116 - EXPEDITED PROCEDURE

Serial Number: 10/608,059

Filing Date: June 27, 2003

Title: USE OF DIRECT GOLD SURFACE FINISH ON A COPPER WIRE-BOND SUBSTRATE, METHODS OF MAKING SAME, AND METHODS OF TESTING SAME (As Amended)

Assignee: Intel Corporation

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Dkt: 884.887US1 (INTEL)

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicants' attorney, John Greaves at (801) 278-9171, or Applicants' below-named representative at (612) 349-9592 to facilitate the prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date Feb. 15, 2005

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 16 day of February 2005.

Dennis T. Kaph  
Name

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Signature